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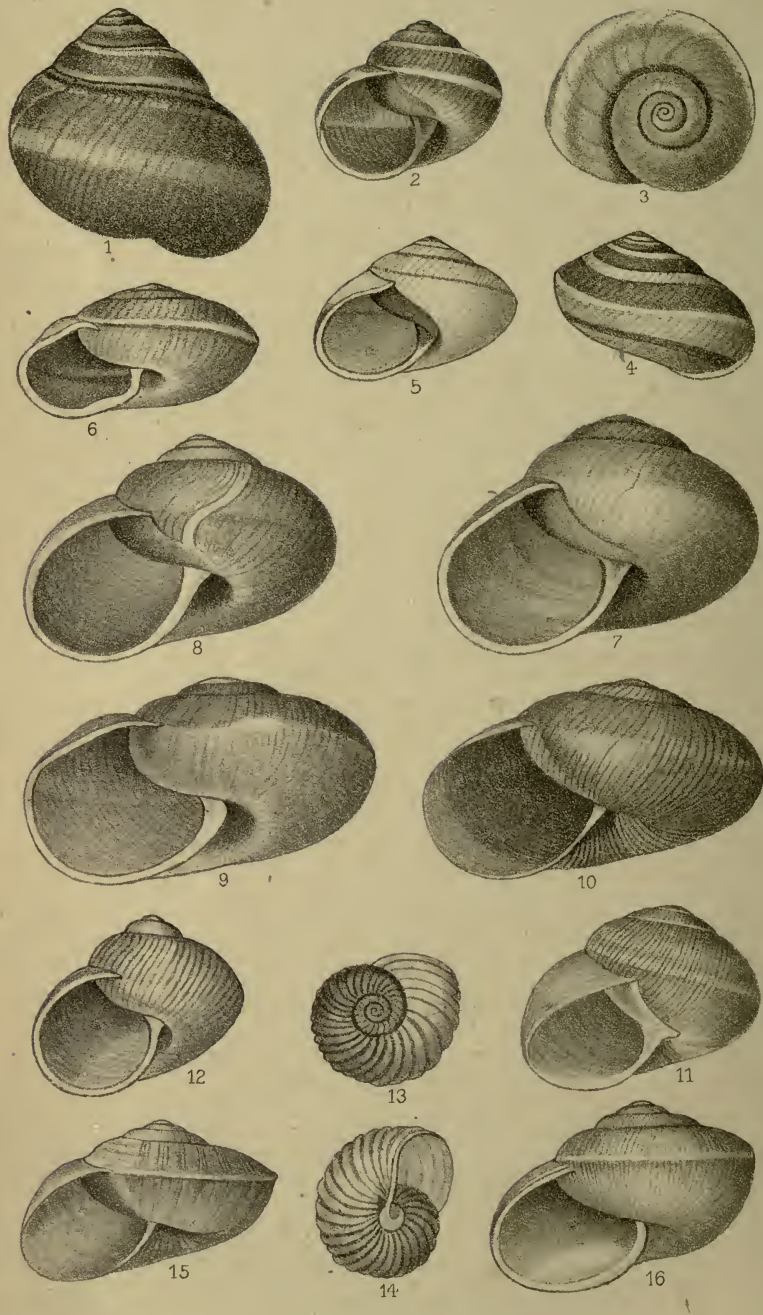
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SECOND SERIES: PULMONATA.

MANUAL

OF

CONCHOLOGY;

STRUCTURAL AND SYSTEMATIC.

WITH ILLUSTRATIONS OF THE SPECIES.

By GEORGE W. TRYON, Jr.

Conservator of the Conchological Section of the Academy of Natural Sciences of Philadelphia.

VOL. II.

ZONITIDÆ.

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MANUAL OF CONCHOLOGY.

Family *ZONITIDÆ*.

Animal protected by a spiral, heliciform shell, within which it is completely retractile; tail provided with a caudal mucus-pore; jaw with a median inferior projection, not ribbed; the central tooth in the lingual ribbon is tricuspid, with the middle cusp long and narrow, laterals bicuspid, marginals acuminate, unicuspidate or bicuspidate.

Shell usually heliciform and perforate or umbilicate, often thin, and more or less transparent, the lip of the aperture simple, neither reflected nor with thickened margin.

The family thus defined includes several hundred species, usually considered Helices, but which differ from that group in the generally thinner, more translucent shells, the aperture with simple margin; the genuine Helices being generally thicker, and with the margin of the aperture either reflected or thickened within.

The jaw also is not ribbed, unlike most Helices, and the dentition differs. Externally, the animal is at once distinguished from Helix by the presence of a mucus-pore. There are some pulmoniferous mollusks having Zonitoid shells, whilst their soft parts place them in Helicidæ, and vice versa. The animals of most of the species, however, are entirely unknown to science, and we are thus reduced to analogies of the shell in determining their systematic position. On the side of the Vitrinidæ the relations of both animal and shell are quite as intimate, the group Otesia, for instance, which at the last moment I decided to include in the latter family, being made a member of the Zonitidæ by Pfeiffer, Fischer and other good authorities. The Vitrinid mantle-lobes exist in a modified form in some of the groups of the present family.

The want of sharply defined characters makes the division of the family into generic and subordinate groups very unsatisfactory, and authorities differ widely as to the systematic position of many of the species. As most of these are known to us by the shell only, whilst some of the groups are differentiated entirely upon anatomical grounds, it is difficult to arrive at satisfactory conclusions regarding them. In Pfeiffer's "Nomenclator Heliceorum," many species are undoubtedly erroneously grouped, but it is the only attempt recently made to arrange all the species, and I believe that the best interests of science will be conserved by adopting Pfeiffer as the basis of my classification, correcting such errors as have been indicated, or are apparent to me, and adopting such new groups as have been proposed by more recent systematists, but usually without attempting their enlargement by incorporating additional species with them. When I shall depart from this rule it will be generally on account of the geographical distribution of a newly proposed group indicating pretty conclusively the common origin of its assigned species, and those not heretofore referred to it, but partaking of its features.

The monographer of the Zonitidæ has ample material for his work in Pfeiffer's several volumes, "Monographia Heliceorum Viventium" and his "Nomenclator Heliceorum," in the beautifully illustrated monograph of Reeve, "Conchologia Iconica," the Helicidæ of Küster's "Conchological Cabinet," Pfeiffer's "Novitates Conchologicæ," Rossmässler's "Iconographie," and numerous other works and papers.

Synopsis of Genera.

Genus NANINA, Gray, 1834.

Shell dextral or sinistral, heliciform, usually rather thin and polished, the periphery rounded or angulated, columellar lip short, reflected, often covering the umbilicus, outer lip simple, sharp.

Animal capable of complete retraction within its shell, the mantle furnished with an anterior lobe often bilobate, and a collar which is sometimes simple, and sometimes provided with one or two lobules reflected upon the shell; these mantle-lobes possess some power of lateral movement and of expansion and retraction. Foot long and narrow, subtruncate posteriorly and

glandular, the pore slit-like, often surmounted by a horn-shaped protuberance.

Distribution. About six hundred species have been described, many of which are simply varietal forms; they inhabit the tropical regions of the old world, Africa, Asia and its islands, Philippines, Polynesia, etc.

The Naninas are closely related to the genus Zonites, which is largely American and European in distribution, although a few of its species occur in countries inhabited by the former. They may be distinguished from Zonites by a generally larger, less polished, thicker shell, and by the animal having cervical mantle-lobes, and frequently polishing appendages, by their genital orifice close to the tentacle, and by the marginal teeth of the radula being bicuspidate.

Subgenus Ariophanta, Desmoulins, 1833.

Shell sinistral, umbilicated, often angulated on the periphery.

Animal. Mantle without polishing lobes; mucus-pore large, without coniform protuberance. *East Indies.*

Subgenus Cœlatura, Pfeiffer, 1877.

Shell dextral, often spirally sculptured, umbilical region excavated, imperforate, columellar lip straight, oblique.

Mucous pore without horn, mantle-lobes but slightly developed. *Is. of Mauritius and Bourbon.*

Subgenus Rotula, Albers, 1850.

Shell dextral, subperforate; spire depressed conical, last whorl carinated at the periphery; columella very short, vertical.

Mucous pore with but a slight protuberance; mantle without polishing lobes, left cervical lobe usually bipartite.

Mauritius, India, East Indies.

Section Pachystyla, Mörch, 1852 (restricted).

Columella thickened and flattened.

Section Stylodonta, Jan, 1832.

Imperforate, rather solid, periphery subangulated; basal margin of aperture somewhat thickened, columella short, oblique, bearing a fold-like tooth.

Erepta, Albers, 1850, is a synonym.

Section CALDWELLIA, H. Adams, 1873.

Shell small, subtrochiform, fragile, translucent, with angular periphery and simple aperture.

Subgenus RHYSOTA, Albers, 1850.

Shell dextral, often large and rather thick for the genus, not transparent, base excavated around the umbilicus.

Mantle without shell lobes, left cervical lobe bipartite; mucous pore surmounted by a corniform protuberance.

East Indies, Philippines, Polynesia.

Section RHYSOTA (restricted).

Upper and lower surface of the shell similarly sculptured, rugose, finely vermiculate or granular; periphery more or less angulated.

Section HEMIPLECTA, Albers, 1850.

Shell granular or striated above, smooth or polished below.

Section EUPLECTA, Semper, 1870.

Shell striated or ribbed above. Cervical lobes of the mantle developed, the left one divided; shell lobes rudimentary; mucous pore with a short horn. *Philippines.*

Inozonites, Pfeiffer, 1883, may be placed here.

Section ROTULARIA, Mörch, 1872.

Shell resembling Rotula. Mucous pore with a horn-shaped protuberance. *Nicobar Islands.*

Section TROCHONANINA, Mousson, 1869.

Shell thin, striated above, smooth below, spire conical, periphery angulated. *Polynesia.*

Section MARTENSIA, Semper, 1870.

Shell conical, keeled, perforate, sculptured above, smooth below. Right shell lobe wanting, left cervical lobe bipartite; mucous pore with a horn. *East Africa.*

I think it very doubtful whether the several African groups proposed by Semper, Martens, Pfeffer, etc., ought really to be separated from Trochonanina. *Ledoulxia*, Bourg., 1885, might as well be united with *Martensia* for the present; it is founded upon very unimportant characters of the shell alone, and takes for its type the variety *albopicta* of *N. Mozambicensis*, the latter being the type of *Martensia*.

Section ZINGIS, Martens, 1878.

Shell heliciform with simple peristome; last whorl with rounded periphery.

Animal without shell lobes, but with two cervical lobes, with horn over the mucous pore; jaw smooth. *Zanzibar.*

? Section HAMYA, Bourg., 1885.

Shell Hyalina-like, strangulated near the aperture, as in Alycæus.

N. REVOILI, Bourg. Quaternary. *East Africa.*

Section TROCHOZONITES, Pfeffer, 1883. *West Africa.*

Section SITALA, H. Adams, 1856.

Shell conoid, thin, whorls numerous, usually spirally ribbed or striated; base convex, narrowly or indistinctly umbilicated.

Animal long and narrow; tail gland surmounted by a distinct horn; two shell lobes and two cervical lobes on the mantle, all of them small and with no separately produced appendages; jaw thin, smooth, concentrically striated in the middle.

India, Burmah, East Indies.

Conulema, Stoliczka, 1871, is a synonym.

Section KALIELLA, Blanford, 1863.

Shell conical, with angulated periphery.

Animal with well-defined caudal appendage. *India.*

Subgenus ORPIELLA, Gray, 1855.

Shell thin, rounded, depressed, whorls convex, the last somewhat flattened basally.

Animal without shell lobes; a protuberance over the mucous pore, and several fleshy appendages in a double row along the back of the tail.

Fiji Islands.

Subgenus XESTA, Albers, 1850.

Shell perforate, or narrowly umbilicate, orbicularly depressed, smooth, usually polished; aperture large, rounded ovate, margin acute, columellar margin dilated and reflexed.

Animal with one or two shell lobes; mucous pore simple, or surmounted by a slightly developed corniform appendage.

Section XESTA (restricted). *East Indies, India*, etc.

Section XESTINA, Pfeffer. *India.*

Section Macrochlamys, Benson, 1832.

Shell depressed globose, pellucid or corneous, smooth and shining.

Mantle with two long tongue-shaped shell lobes; left cervical lobe divided into two diverging portions; mucous pore with conical appendage. *India*, etc.

Tanychlamys, Benson, 1834, and *Orobia*, Albers, 1860, are synonyms.

Section Macroceras, Semper, 1870.

Conical appendage of the mucous pore very long. *Philippines.*

Section Bensonia, Pfeiffer, 1855.

Shell thin, perforate, obliquely sculptured above, crossed by impressed revolving lines. *India.*

Section Sophina, Benson, 1859.

Shell with a callous columella, angulated at the basal margin, and with a more or less acute umbilical carina.

Foot long, obliquely truncate, with a large tail gland and distinct horn-shaped appendage; mantle lobes as large as in *Helicarion.* *Burmah.*

Section Eurypus, Semper, 1870.

Shell with obscurely keeled periphery, umbilicus very narrow.

Foot with the back broad, not carinated. *Fiji Islands.*

Aulacopus, Pfeffer, is a synonym.

Section Durgella (Blanford), Stoliczka, 1871.

Shell thin or membranaceous, globose or globosely conoid, polished, narrowly perforate, columellar margin not much thickened.

Dorsal lobes moderate, shell lobes very ample, triangular when extended; mucous pore well developed, with large overhanging lobe. *India*, *Burmah.*

Section Microcystis, Beck, 1837.

Shell small, subperforated, usually slightly keeled, glabrous; aperture large, subvertical.

Mantle margin with shell lobe on right side only; left cervical lobe bipartite. *Polynesia.*

Helicopsis, Beck, 1837, and ? *Platycloster*, Hasselt, are synonyms.

Section MICROCYSTINA, Mörch, 1872.

Shell small, polished, with a deep notch at the columellar margin.

Animal like *Microcystis*. *India.*

Section SAGDINELLA, Mörch, 1872. *Nicobar Islands.*

Section THAPSIA, Albers, 1860.

Shell orbicularly depressed, thin, pellucid, undulately decussated, narrowly perforated; peristome acute, columellar margin narrowly reflected. *West Africa.*

Section LAMPROCYSTIS, Pfeffer. *India, Polynesia.*

Section OXYTES, Pfeiffer, 1855.

Shell usually large, obliquely striate or plicate, depressed, carinated, umbilicated; peristome expanded, thin, columellar margin thickened.

Animal with short somewhat thickened tentacles; mucous gland without marked appendage; right cervical lobe triangular, well developed, left lobe bipartite, anterior portion large, posterior very small and giving off short processes; left shell lobe a narrow ribbon, reflected over the peristome, no right shell lobe. *India.*

Subgenus SESSARA, Albers, 1860.

Shell imperforate, depressed orbicular, costulate-striate above, base smooth, excavated, periphery angulated; aperture depressed, wide, basal lip denticulated, columellar thickened.

Mantle lobes small, but as in Xesta. *Burmah.*

Subgenus GUILLAINIA, Bourguignat.

Shell thick, calcareous, strongly striate or costulate, globular, bluish white, peristome simple, obtuse, interior dark chocolate-colored.

Animal with a large profound mucous pore with horn-like appendage. Dentition and jaw as in *Hyalina*.

The shell reminds one of the genus *Leucochroa*. *East Africa.*

Genus ZONITES, Montfort, 1810.

Shell subdepressed, umbilicated, very thin, more or less transparent; aperture semilunar, usually without teeth; lip thin, sharp.

Animal elongate, completely retractile within the shell, having a caudal mucus-pore, more or less developed, but consisting usually of a simple linear slit; mantle lobes small, not reflected on the shell; genital orifice distant from the right tentacle; jaw with a well-marked median rostrum; lateral teeth bicuspidate, marginals sharp, narrowly unicuspidate.

Europe, *Western Asia*, *America*.

Subgenus ZONITES (typical).

Shell depressed orbicular, widely umbilicated, striated above, smooth below, rather solid, whorls numerous (6 or 7), lip sharp, with a slight parietal callus.

Labial palpi small; caudal gland reduced to a simple slit.

Southern Europe, *Asia Minor*.

The synonyms are *Ægopis*, Fitzinger, 1833, *Tragomma*, Held, 1837, *Helicodes*, Dumas, 1847, *Verticillus*, Moquin-Tandon, 1855, *Archæozonites*, Sandberger (fossil).

Subgenus HYALINIA, Ferussac, em. 1819.

Shell thin, vitreous, fragile, shining, unicolored, corneous; last whorl not descending at the aperture; peristome thin, sharp.

Mucus-pore shallow, hardly distinct, extremity of the tail slightly sinused, skin bluish.

Northern Hemisphere, species numerous.

Section VITREA, Fitzinger, 1853.

Shell small, fragile, shining, hyaline, smooth, convexly depressed, perforate or imperforate, aperture lunate.

Crystallus, Lowe, 1854, is a synonym.

Section POLITA, Held, 1837.

Shell depressed or subdiscoidal, umbilicate, smooth, shining, pellucid, corneous, the base more or less milky opaque, aperture obliquely lunate.

This is the typical group. Its synonyms are *Oxychilus*, Fitz., 1833; *Lucilla*, Lowe, 1854; *Euhyalina*, Albers, 1857; *Aplostoma*, Moq.-Tand., 1855.

Section ZONITOIDES, Lehmann, 1864.

The animal differs from the typical Hyalinia in possessing a dart, like the Helicidæ; the shell is a *Polita*. *European*.

Section NAUTILINUS, Mousson, 1872.
Shell nautiloid, involute.

Section CONULUS, Fitzinger, 1833.
Shell small, pellucid, corneous, globosely turbinated or conic, thin, usually perforate, aperture lunar, oblique.
Trochiscus, Held, 1837, and *Petasia*, Beck, 1837, are synonyms.

Section CONULOPOLITA, Böttger, 1879.
Not umbilicated, base planate, excavated in the middle; shell large, subturbinate; whorls $6\frac{1}{2}$–7, very slowly increasing; aperture depressed, lunar. *Caucasus.*

Section DIERAMA, Pfeiffer, 1877.
Not described; instituted for a single species, H. DIERAMA, Pfr. *Hab. unknown.*

Subgenus PHACUSSA, Hutton, 1884.

Shell depressed; periphery rounded; whorls 5–6, gradually increasing. Mantle included. Jaw with flat ribs. *New Zealand.*

Subgenus STENOPUS, Guilding, 1828.

Shell depressed or conical, perforated, thin, diaphanous, lip sharp.
Animal with a linear locomotive disk, separated from the lateral parts by a groove on either side as in Vaginula; caudal gland with a retractile appendage.
Mexico, *Venezuela*, *West Indies.*
Is *Guppya*, Mörch, 1867, and *Habroconus*, Crosse and Fischer, 1872.

Subgenus OMPHALINA, Rafinesque, 1819.

Shell widely umbilicated, depressed orbicular, striated above, smooth and shining below, aperture large. Labial palpi large, caudal pore well-marked.
Europe, *United States*, *Mexico*, *Guatemala.*
Section OMPHALINA (restricted). *United States.*
Section MORELETIA, Gray, 1855. *Mexico*, *Guatemala.*
Section ZONYALINA, Martens, 1865. *Mexico.*
Said to be distinguished from Moreletia by the want of the outer cervical lobe of the mantle.

Section Patulopsis, Strebel, 1880.

Shell *Patula*-like, periphery angulated, upper surface finely ribbed-striate, umbilicus open, perspective. Left cervical lobe of the mantle divergently bipartite. *Mexico.*

Section Ægopina, Kobelt, 1879. *Europe.*

Includes the larger European species and is scarcely distinct from *Omphalina*. *Retinella*, Shuttl., is a synonym.

Section Mesomphix, Rafinesque, 1819.

Shell umbilicate or perforate, conical or conical-depressed, thin, plicately striated, brownish horn-color, usually lighter colored below; whorls close; aperture lunar ovate, lip sharp, subreflexed on the columella. *United States.*

Barely distinguished from *Omphalina* by its closer whorls, plicate striæ, and more conical form.

Subgenus Gastrodonta, Albers, 1850.

Shell subperforate or narrowly umbilicated, orbicularly depressed, light horn-color, sometimes glassy, with more or less numerous wrinkle-like striæ; whorls, 5–7; aperture lunate, its interior with lamellar denticles, not reaching the acute margin. *United States.*

Section Gastrodonta (typical).

Denticles within the outer and basal walls of the aperture, occurring at rest-periods of the growth and persistent.

Section Ventridens, Binney and Bland, 1869.

Aperture with revolving series of pliciform teeth within the base only.

Section Helicodiscus, Morse, 1864.

Minute, planorboid, with spiral striæ; aperture lamellarly toothed within the outer lip.

? Section Odontosagda, Martens, 1860.

Shell whitish, depressed, thin, umbilicated; whorls 6, the last with convex base; aperture lamellarly toothed. *Haiti.*

? Section Proserpinula, Albers, 1860.

Discoidal, hyaline, transparent, covered perforate; whorls $4\frac{1}{2}$, planulate, the last with shining callus around the umbilical region; aperture with a spiral lamella attaining the margin. *Jamaica.*

Subgenus STRIATURA, Morse, 1864.

Shell small, striate, thin, translucent, without teeth in the aperture.

Jaw almost smooth, with a median furrow and notch; central tooth of the radula very large. *United States.*

Distinguished chiefly by the jaw and dentition.

Section PSEUDOHYALINA, Morse, 1864.

Shell minute, subdiscoidal, slightly convex above, unicolored, closely striate-ribbed, umbilicus moderate. *N. America.*

Chanomphalus, Strebel, 1880, is a synonym.

Section PYCNOGYRA, Strebel, 1880.

Shell many-whorled, depressed conical above, whorls narrow, ribbed-striate, translucent; umbilicus rather large, bordered by an obtuse angle. *Mexico.*

Subgenus JANULUS, Lowe, 1852.

Shell umbilicated, depressed orbicular, costulately striate above, rather smooth below; whorl 7–8½, closely revolving, the last convex at the base; aperture lunar, peristome simple, thin, with a callous ring within. *Madeira.*

Jaw and radula typical.

Genus SELENITES, Fischer, 1879.

Shell depressed orbicular, widely perspectively umbilicated, strongly striate above, last whorl obliquely depressed above, depression becoming more marked at the aperture; extremities of the peristome approaching.

Animal having the jaw of Zonitidæ, but the dentition of the Testacellidæ. *United States.*

On account of the jaw and dentition, Dr. Fischer has made this group the type of a family Selenitidæ, interposed between Testacellidæ (having similar teeth, but no jaw), and Zonitidæ (having similar jaw, but different teeth).

Section HAPLOTREMA, Ancey, 1881.

Shell much smaller, peristome sharp.

Section MORCHIA, Albers, 1860.

Shell darker colored, striatulate. *West Indies.*

Genus CHAROPA, Albers, 1860.

Shell umbilicated, depressed, ribbed, usually hairy; periphery rounded.

Animal with caudal mucous gland. Jaw flat-ribbed. Marginal teeth of the radula broad, usually with many points.

New Zealand, *Polynesia.*

Hutton (Trans. N. Zeal. Inst., xvi, 200) has made this the type of a family Charopidæ, the animal having heliciform dentition, with a mucus-gland on the tail, as in Zonites.

Section CHAROPA (typical).

Section GERONTIA, Hutton, 1884.

Shell depressed, widely umbilicated, striated; periphery rounded; whorls about five, slowly increasing; aperture oblique.

Animal heliciform; mantle rather posterior, included; tail acute, with a mucus-pore but no papilla; jaw smooth or striated.

New Zealand.

Section PYRRHA, Hutton, 1884.

Shell subperforate, thin, translucent, of $4\frac{1}{2}$–$5\frac{1}{2}$ regularly increasing whorls. Mantle subcentral, reflected over the peristome of the shell with an even margin; tail truncate, with a large papilla and mucous gland. Jaw with flat ribs. Marginal teeth broad, with several points. *New Zealand.*

Section PSYRA, Hutton, 1884.

Imperforate or narrowly umbilicated, ribbed, not hairy, periphery rounded. Jaw and teeth as in *Charopa.*

New Zealand.

Section THERASIA, Hutton, 1884.

Subperforate or narrowly perforate, conoidal, depressed, periphery subcarinated; whorls smooth, striated or with membranous plaits. Jaw with flat ribs. Marginal teeth broad, usually with several points. *New Zealand.*

Section THALASSIA, Albers, 1860.

Shell narrowly or moderately perforate, conic orbicular, thin, pellucid; whorls five or six, smooth or with membranous plaits, slowly increasing, the last round or with angulate or carinate periphery; umbilical region impressed; peristome simple, acute, columellar margin slightly reflexed. Jaw flat-ribbed. Marginal teeth longer than broad, with one point very much longer than the others. *New Zealand*, *Australia*, *Polynesia.*

Genus NANINA, Gray, 1834.

Subgenus ARIOPHANTA, Desmoulins, 1833.

N. KADAPAENSIS, Nevill. Pl. 1, figs. 1, 2.

Shell perforate, solid, obliquely striate, chestnut colored, white zoned at the suture, periphery and base; whorls $5\frac{1}{2}$, the last descending anteriorly, base inflated; aperture concolored, lip obtuse, white, columellar margin a little reflected, almost covering the perforation. Diam. 37, alt. 27 mill.

Kadapa, India.

Long known under the name of *Helix Nicobarica*, Chemn., but is not found at the Nicobar Is.

N. LAIDLAYANA, Benson. Pl. 1, figs. 3, 4, 5.

Shell narrowly imperforate, thin, obliquely striate, decussated by crowded spiral striæ, translucent, shining, whitish, with a narrow chestnut zone at the suture, a wider band above the periphery, and a narrow one below it, throat and lip chestnut colored; whorls 5, suture lightly impressed; the last whorl angulated at the periphery, slightly descending in front, convex below, columellar margin greatly narrowing the perforation. Diam. 27, alt. 15 mill.

Bengal.

N. parietalis, Martens, is a synonym. Sometimes only the sutural and a narrow peripheral band are present.

N. THYREUS, Benson. Pl. 1, fig. 6.

Shell umbilicated, depressed, solid, bluish horn color, closely, sharply striate above, with obsolete slight spiral striæ; whorls 5, with sutures scarcely impressed; body whorl carinated, below the carina obsoletely chestnut fasciated, not descending at the aperture; base shining, radiately striate; interior purplish brown, white zoned in the middle. Diam. 35, alt. 16 mill.

Southern India.

N. ryssolemma, Gray, is a synonym.

N. CYSIS, Benson. Pl. 1, figs. 7, 8.

Shell umbilicated, rather solid, closely plicate striate, light olivaceous horn-colored, under a deciduous epidermis; whorls 5, with impressed suture, the last whorl wider, tumid, slightly descending in front; periphery very obsoletely angulated; aper-

ture subpearly, lip a little thickened, the extremities joined by a thin parietal callus. Diam. 45, alt. 24 mill.

Nilgherry Mts., India.

N. ampullarioides, Reeve (fig. 8) is a synonym.

N. AURIS, Pfr. Pl. 1, figs. 9, 10.

Shell umbilicated, thin, closely obliquely striulate, yellowish brown; suture linear, very minutely crenulated; whorls $4\frac{1}{2}$, the last not descending, subangulated at the periphery, the base tumid, more shining. Diam. 47, alt. 22 mill.

Koondah Mts., India.

N. INTUMESCENS, Benson. Pl. 1, fig.

Umbilicus narrow, nearly covered, shell thin, plicate striate, obsoletely decussated by revolving lines, yellowish brown, corneous above the periphery, and around the umbilicus a little lighter; whorls $4\frac{1}{2}$, a little descending at the aperture, tumid below and compressed around the umbilicus, lip white, subexpanded. Diam. 32, alt. 22 mill.

Mahabaleshwar, India.

N. BAJADERA, Pfr. Pl. 1, figs. 12–14.

Narrowly umbilicated, rather thin, diaphanous, strongly plicate, greenish or reddish brown; whorls 4, turgid, rapidly increasing, the last descending, periphery obtusely angulated, lip white, expanded. Diam. 24, alt. 17 mill.

Bengal.

N. ammonia, Val. (figs. 13, 14), is the juvenile of this species.

N. RETRORSA, Gould. Pl. 1, fig. 15.

Perforate rather thin, striate, with confluent, undulating, finely rugose, subspiral impressed lines, light chestnut or yellowish brown; whorls $5\frac{1}{2}$, rapidly increasing, the last acutely carinate, base gibbous. Diam. 44, alt. 20 mill.

Burmah.

N. IMMERITA, W. Blanford. Pl. 1, fig. 16.

Narrowly umbilicated, reddish brown, thin, obliquely striate; whorls $4\frac{1}{2}$, the last large, carinate, the carina more obtuse anteriorly, more tumid and somewhat shining below.

Diam. 25, alt. 14 mill.

So. Canara, India.

N. Himalayana, Lea. Pl. 2, figs. 19, 17, 18.

Narrowly umbilicated, thin, pellucid, costulate above, light brown, whorls $4\frac{1}{2}$–5, the last subcarinate, often obscurely brown-banded below the carina, base tumid. Diam. 30, alt. 15 mill.

Himalaya Mts. and *Ganges region*, *India.*

M. interrupta, Benson (figs. 17, 18), is identical.

N. lævipes, Müller. Pl. 2, figs. 20, 21.

Perforate, thin, incremental striæ distinct, decussated by obscure spiral lines; light corneous; whorls $4\frac{1}{2}$, the last subangulate and banded on the periphery, not descending at the aperture, inflated below. Diam. 28, alt. 14·5 mill.

Malabar, *Tranquebar.*

It is *Helix candida* and *spadicea*, Gmelin.

Var. trifasciata, Chemn. Fig. 21.

Body-whorl three-banded with chestnut.

N. cyclotrema, Benson. Pl. 2, fig. 22.

Umbilicus covered, obliquely striulate, granulate, white under a corneous epidermis; whorls $4\frac{1}{2}$, apex pitted, suture impressed, periphery obtusely angulated and fasciate, descending at the aperture; peristome dilated, slightly reflexed, columellar lip covering the umbilicus. Diam. 22, alt 11 mill.

Himalaya region.

N. Brookei, Adams and Reeve. Pl. 2, fig. 23.

Umbilicus nearly covered, solid, obtusely angulated on the periphery, closely striated and minutely granulated, above undulately broadly plicate, shining, chestnut-colored; whorls 5, the last minutely malleated and dark chocolate-colored below the periphery; aperture bluish white, the margins joined by a callus, columella dilated over the umbilicus. Diam. 76, alt. 45 mill.

Borneo.

Austen writes: The sinistral form of the shell counts for very little. H. Brookei possesses no mucous gland and therefore cannot even be included among the Zonitidæ. It is very interesting though to note that it has a right and left shell-lobe.—Shells of India, Pt. iv, 133. It is *Helix gigas*, Pfeiffer.

N. Cambojiensis, Reeve. Pl. 6, fig. 9.

Very narrowly umbilicated, solid; above fulvous with a sutural black band, below yellowish white, with a wide black band below the periphery, and a black umbilical area; whorls 6, rather smooth, slightly striate at the suture, the last with obtusely angulated periphery, aperture white within. Diam. 82 mill.

Cambodia.

Helix Mouhoti, Reeve, is a synonym.

N. granaria, Bock. Pl. 2, fig. 24.

Thin, narrowly umbilicated; whorls 6, with growth-lines and finely granular spiral sculpture, producing a chagreened appearance, especially on the last whorl, which is also considerably wrinkled, with a somewhat raised keel at the periphery; olive-brown, becoming pinkish gray at the apex.

Diam. 40, alt. 31 mill.

Mt. Sago, Sumatra; alt. 2000 ft.

N. Sumatrensis, Mousson. Pl. 2, fig. 25.

Narrowly perforate, with rugose close growth-lines, and irregular spiral lines and malleate impressions; yellowish brown, with a subperipheral obscure chestnut band; whorls 6, the last not deflected in front. Diam. 51 mill.

Sumatra.

N. sannio, Pfr. Pl. 2, fig. 26.

Very narrowly umbilicated, solid, obliquely costulately striate, scarcely shining, above light yellowish brown; whorls $6\frac{1}{2}$, slowly enlarging, the last not descending, periphery angulate, below it cinnamon-colored; aperture white, shining, lip thick, shortly reflected, columellar lip dilated over the umbilicus.

Diam. 38, alt. 21 mill.

Habitat unknown.

N. Hugonis, Pfr. Pl. 2, figs. 27, 28.

Very narrowly umbilicated, solid, closely and sharply granulate striate, light brownish; whorls 8, slowly increasing, yellowish brown above the suture, and at the acutely carinated periphery of the last whorl, below the carina chestnut-colored; aperture pearly, lip thin, simple. Diam. 38, alt. 22 mill.

Ins. Labuan.

N. MINDAIENSIS, Bock. Pl. 2, fig. 29.

Narrowly umbilicated, semitransparent; reddish brown, with a white-tipped lip; whorls 6, with finely granulated radiating striæ, the last whorl acutely keeled. Diam. 30, alt. axis 13 mill.
Mindai, Borneo.

Darker colored than the next species, with one whorl less, more convex, not so sharply keeled, umbilicus narrower, sculpture coarser.

N. MARSEVEENI, Bock. Pl. 3, fig. 32.

Umbilicated, thick; light-brownish horn-color, somewhat pale around the umbilicus; whorls 7, with feebly granulated, obliquely arcuate growth-lines, last whorl with a very acute, pale peripheral keel. Diam. 33, alt. axis 14 mill. *Sumatra.*

N. SACCATA, Pfr. Pl. 3, fig. 33.

Perforate, very thin, obliquely striulate, decussated by minute, crowded spiral lines, scarcely shining, pellucid, reddish corneous, suture impressed, narrowly margined; whorls 4½, rapidly enlarging, the last not descending, narrowly carinated, obliquely rugose above the carina, base convex, saccate in front.
Diam. 28, alt. 16 mill. *India.*

N. REGALIS, Benson. Pl. 2, figs. 30, 31.

Perforate, closely undulately striate and granulate, fasciated or unicolored; whorls 6, the last not descending, shining below, very minutely decussated, the circular striæ obsolete towards the umbilicus. Diam., 27 mill. *Borneo.*

Var. UNICOLOR. Purple-brown.

Var. VITTATA, Ads. and Reeve. Undulating striæ less conspicuous, lighter colored, with four reddish bands, carina and umbilical area yellowish.

Var. MAJOR. More depressed, reddish brown, without bands, umbilical area white. Diam. 34 mill.

N. JANUS, Chemn. Pl. 3, figs. 34, 36.

Perforate, thin, diaphanous, closely obliquely costulate-striate; brownish above, reddish chestnut below and somewhat shining; whorls 7, the last more or less carinate. Diam. 36 mill.
Mt. Ophir, Malacca.

It is *N. Mackensiana*, Soul. (fig. 36).

N. Balesteriana, Lea. Pl. 3, fig. 35.

Perforate, rather thin, obliquely subgranularly sculptured; chestnut-colored; whorls 7, the last obtusely angulated at the periphery.

Malacca, Borneo, Sumatra?

Pfeiffer considers this a synonym of the last species, but it appears to me to differ considerably in outline. My artist has exaggerated an effect probably of rugose growth-lines into rather conspicuous stripes.

N. Albersi, Martens. Pl. 3, fig. 37.

Narrowly perforate, with close, suboblique, minutely undulated striæ; yellowish brown above, chestnut-colored below; whorls 6, the last with an obtuse peripheral angle.

Diam. 30, alt. 18·5 mill. *Malacca.*

This, as well as the last species, is made a synonym of *N. Janus* by Pfeiffer.

N. Rumphii, Busch. Pl. 3, fig. 38.

Perforate, dark cinnamon-color, white-banded on the carinate periphery, irregularly rugulose striate above, striate below; whorls $5\frac{1}{2}$; aperture brownish within. Diam. 44 mill.

Java.

N. clypeus, Mousson. Pl. 3, fig. 39, 40.

Narrowly umbilicated, acutely carinate, flattened above, convex below, thin, fragile, striate, broadly rugose and obliquely subundulated above, spirally lined below, light corneous, lighter around the umbilicus, a brown line below the carina.

Diam. 1–1·5 inches. *Java.*

Var. Zollingeriana. Carina very acute, with the band well marked, the surface light yellowish brown.

Var. Jagoriana. Color reddish brown, without a band, the carina more obtuse.

N. foveata, Pfr. Pl. 3, fig. 41.

Subumbilicated, thin, with crowded subacute striæ, and revolving impressed lines, shining; whorls $5\frac{1}{2}$, cinnamon-color, the carina white, shaded below with chestnut, umbilical region lighter. Diam. 39 mill.

India.

N. NASUTA, Metcalfe. Pl. 3, fig. 42.

Subimperforate, very thin, obliquely striated, with light, very small concentric lines, waxy pellucid, very light greenish corneous; whorls $5\frac{1}{2}$, suture ridge-margined, last whorl not descending in front, acutely carinated. Diam. 36 mill.

Borneo.

Unfigured Species.

N. TAIVANICA, Mollend. *Formosa.*
N. LINDSTEDTI, Pfr. *Malacca.*
N. SARAWAKANA, Dohrn. *Borneo.*

Subgenus CŒLATURA, Pfr., 1877.

N. CŒLATURA, Fér. Pl. 3, fig. 43.

Imperforate, rather solid, the incremental striæ distinct, crossed by irregular distant revolving lines; whorls 4 or 5, dark brown; lip somewhat thickened. Diam. 28 mill.

Ins. Bourbon.

The synonymy includes *N. exarata*, Wiegm, and *N. rufina*, Jay.

N. DUPONTI, Morelet. Pl. 3, figs. 44, 45.

Imperforate, solid, with crowded oblique striæ, and distant spiral sulci; reddish brown; whorls 5, the last deflected in front; lip thickened, its extremities connected by a parietal callus. Diam. 40 mill.

Mauritius (subfossil).

N. sulcifera, Barclay (fig. 45), is considered a synonym.

N. BEWSHERIANA, Morelet. Pl. 3, fig. 46.

Imperforate, arcuately costate-striate; whorls $5\frac{1}{2}$, the last obtusely angulated on the periphery, angle evanescent towards the aperture; peristome angularly incurved above; bleached white. Diam. 33, alt. 19 mill. *Ins. Rodriguez.*

Subfossil.

N. SIMPLEX, Lam. Pl. 3, fig. 47.

Imperforate, obliquely striate, light reddish brown, with darker fasciations, apex reddish. Diam. 40 mill.

Amboina.

A doubtful member of the group.

N. SCALPTA, Martens. Pl. 4, figs. 48–51.

Perforate, thin, closely striate, decussated by obsolete spiral lines; reddish horn-color; whorls 6, the last angulated on the periphery, the angle becoming evanescent in front.

Diam. 19 mill.

Mauritius.

This is *Helix rufa*, of Pfr. and Reeve, but not of Lesson, the latter being identical with *H. Novæ-Hiberniæ*, of Quoy. *N. semifusca*, Desh. (figs. 50, 51), is probably the same, although the characteristic spiral sculpture is neither described nor shown in the figure.

Subgenus ROTULA, Albers, 1850.

N. LINOPHORA, Morelet. Pl. 4, figs. 52, 53.

Barely perforate, thin, costulate; corneous brown or greenish, epidermis whitish, chiefly remaining at the suture and below the carina; whorls, 6. Diam. 12 mill.

Ins. Bourbon, Mauritius.

N. SEMICERINA, Morelet. Pl. 4, figs. 54, 55.

Scarcely perforate, costulate-striate, thin; brownish or greenish corneous, sometimes with a single brown band above the carina, darker below, with a wide light band beneath the carina; whorls 6. Diam. 16 mill.

Mauritius.

N. Rawsonis, Barclay, is a synonym.

N. BIJUGA, Stoliczka. Pl. 4, figs. 56–59.

Narrowly umbilicated, thin, corneous, light yellowish brown; whorls $5\frac{1}{2}$–$6\frac{1}{2}$, suture simple, rarely thread-margined above, closely obliquely costulate, and more or less distinctly crossed by still closer revolving striæ, crispate or subgranular, smoother below the peipheral carina, except a couple of impressed spiral striæ immediately under it. Diam. 17 mill.

Penang.

N. ARGENTEA, Reeve. Pl. 4, fig. 60.

Perforate, thin, smoothish, lightly and very minutely decussated; greenish brown, pellucid, with wide silvery epidermal bands; whorls 6, the last not descending. Diam. 13 mill.

Mauritius and Isle of Bourbon.

N. semicerina, var. *turbinata*, Morelet, is a synonym.

N. ANCEPS, Gould. Pl. 4, figs. 61, 62.

Scarcely perforate, light corneous, striated above, shining below; whorls 6, smooth below the periphery. Diam. 17 mill.

Tavoy, Burmah.

N. ARATA, Blanford. Pl. 4, figs. 70, 71.

Imperforated, thin, corneous, obliquely plicate-striate above, below smooth, a little shining, radiately striulate; whorls 7, suture submarginate. Diam. 17–23 mill.

Ava, Yunnan.

Very close to *N. anceps*, but the spire is higher, the umbilical region more excavated, the peripheral keel less acute, and the epidermis darker.

N. SERRULA, Benson. Pl. 4, figs. 63–65.

Narrowly umbilicated, whitish horn-color; whorls 7, closely plicatulate above, serrulating the peripheral carina—which is impressed margined below. Diam. 14 mill.

Bengal.

N. BENSONI, Busch. Pl. 4, fig. 66.

Perforate, grayish white, acutely crenulately carinate; whorls 6, the last scarcely striate on the base. Diam. 12 mill.

Bengal.

N. SOLIDULA, Pfr. Pl. 4, fig. 67.

Scarcely perforate, somewhat solid, obliquely costulate-striate, brownish; whorls $5\frac{1}{2}$, suture submargined, base with obsolete spiral lines; columella callously thickened, nearly closing the perforation. Diam. 12 mill.

Habitat unknown.

N. CLIMACTERICA, Benson. Pl. 4, figs. 68, 69.

Imperforate, whitish under an olivaceous epidermis, above sharply radiately plicate, smoother below; whorls 8, narrow, spire gradate. Diam. 19 mill.

Bengal.

N. AUSTENI, Blanford. Pl. 4, figs. 72, 73.

Imperforate, thin, corneous, above closely arcuately costulate, the riblets vanishing below the carina, polished, radiately striulate; whorls $6\frac{1}{2}$, narrow, slightly gradate; umbilical region impressed. Diam. 15 mill.

Mt. Garo, India.

The spire is higher than in *N. climacterica*, the aperture more rhomboidal.

N. RECEDENS, Pfr. Pl. 5, fig. 78.

Imperforate, solid, closely costulately striate above, light flesh color; whorls 6, narrow, carina brown-banded, base flattened and striate. Diam. 12 mill.

Hab. unknown.

N. KASHMIRENSIS, Nevill. Pl. 5, figs. 13–15.

Umbilicus narrow, subplicate above, smoother below, minutely punctate. Diam. 7·5, alt. axis 3·75 in.

Sonamarg, Kashmir.

N. IMPLICATA, Nevill.

Shell like *N. semicerina*, but entirely smooth, whorls more depressed and concave, the last scarcely carinate; coloration similar.

Peter Botte Mt., Mauritius.

Unfigured.

Section PACHYSTYLA, Morch, 1852.

N. INVERSICOLOR, Fér. Pl. 6, figs. 89–92.

Imperforate, acutely carinate, striate and spirally lineate; light chestnut-colored to dark chocolate, almost black, the lighter colored specimens having a darker base, unicolored or obscurely darker-banded at the suture and below the periphery, or sometimes angularly and irregularly marked and clouded with gray on the upper surface; aperture from chestnut-color to dark purple. Diam. 39, alt. 22 mill.

Mauritius.

It is *N. bicolor* and *N. Mauritiana* of Lamarck, and *N. Puerocunæ*, Peron; the juvenile is *N. plebeja*, of the Berlin Museum, teste Anton.

N. MAURITIANA, Pfr. Pl. 6, figs. 93, 95.

Imperforate, rather solid, finely striated, microscopically decussated by close, slight spiral impressed lines; yellowish brown, often lighter colored below, columella white, interior of aperture flesh-color. Diam. 22, alt. 17 mill.

Mauritius.

This is *N. stylodon* of Reeve, not Pfeiffer. The description is from the adult, described by Pfr. as *N. leucostyla* (fig. 95), that of the juvenile *N. Mauritiana* having priority; the latter is subperforate.

N. Mauritianella, Morelet. Pl. 6, figs. 96, 97.

Imperforate, umbilical region impressed, upper surface rather rugosely striate, base smoother; horn-color or yellowish brown, the peripheral angle often a narrow darker band, lip flesh-brown. Diam. 17, alt. 10–12 mill.

Mauritius.

Is very like a *N. inversicolor* in miniature.

N. rufozonata, H. Adams. Pl. 6, fig. 100.

Scarcely perforate or imperforate, umbilical region impressed, closely rugosely arcuately striate above, smoother below; light yellowish brown, with a dark chestnut band on the obtusely angulated periphery, and a broader band at the suture; whorls 6. Diam. 15, alt. 8·5 mill.

Mauritius.

N. Nevilli, H. Adams. Pl. 6, fig. 98.

Scarcely perforate, somewhat solid, closely arcuately striated above, the striæ granulose; yellowish brown; whorls 8, the last not descending at the aperture, subangulate on the periphery; margin of aperture acute, labiate within. Diam. 12, alt. 7 mill.

Mauritius.

Differs from *N. rufozonata* in having no bands, but two additional whorls, although smaller, and in some minor particulars.

N. detecta, Fér. Pl. 5, figs. 75–77; pl. 6, figs. 3, 4.

Imperforate, lenticular, strongly keeled, costulately striate; whorls $5\frac{1}{2}$, keel prominent, in all the whorls appressed to the suture; yellowish brown. Diam. 14, alt. 6 mill.

Ins. Bourbon.

N. Bewsheri, H. Adams (fig. 77) is certainly a synonym, and I think that *N. Frappieri*, Desh. (figs. 3, 4) may also be placed here.

N. Barclayi, Benson. Pl. 6, figs. 1, 2.

Minutely umbilicated, horny, rough, rudely obliquely lightly striated; whorls 5 to 6, with margined suture, last whorl obtusely keeled, more convex beneath. Diam. 5, alt. 3 mill.

Mauritius.

N. Eudeli, Desh. (fig. 2), the sole example of which was crushed after being drawn, but prior to description, may possibly be this species as surmised by Nevill; it appears, however,

to have been smoother and lighter colored and somewhat larger, 7 mill. diam.

N. Rodriguensis, Crosse. Pl. 6, fig. 99.

Scarcely umbilicated, thin, strongly striate, and with microscopic spiral lines; olivaceous brown; whorls $5\frac{1}{2}$, suture well marked, the last whorl obtusely angulated on the periphery, nearly smooth and somewhat shining on the base.

Diam. 12, alt. 7 mill.

Ins. Rodriguez.

Rather distantly related to the several foregoing species.

Section Stylodonta, Jan., 1832.

N. unidentata, Chemn. Pl. 6, figs. 84, 85.

Imperforate, striated, sculptured with concentric wrinkles and oblique decussating minute lines; yellowish brown to dark chestnut-colored; whorls 6, the last angulated and sometimes narrowly banded on the periphery; lip slightly expanded; columellar tooth-like fold large. Diam. 2, alt. 1·75 inches.

Seychelles Is.

N. militaris, Pfr. (unfigured), may be the more depressed form of this species (fig. 85). The synonymy includes *N. microdonta*, Desh.; *N. ventricosa*, Jan.; *N. uniplicata*, Mörch.

N. cepoides, Lea. Pl. 6, figs. 86, 87.

Imperforate, plicate-striate, here and there obsoletely spirally striate; whorls $6\frac{1}{2}$, convex; brownish above, yellowish brown beneath, often narrowly brown banded at the suture and periphery, these bands frequently overlaid by a fugacious coloring of yellowish white or pure white, more or less broken up into patches; aperture narrow, oblique, the lip expanded, the columellar plication distinct. Diam. 2, alt. 1·75 inches.

Philippine Islands.

N. dolium, Sowb., is a synonym.

N. Studeriana, Fér. Pl. 6, fig. 88.

Imperforate, rather thin, obliquely striated and transversely very minutely wrinkled; whorls 6, upper ones rather flattened, elegantly granulated, the last obsoletely angled or marked at the periphery with an impressed groove; dark brown or olive-brown,

the reflected lip and slightly twisted columella and interior of aperture white. Diam. 2·7, alt. 2·4 inches.

Seychelles Is.

The columellar plication is obsolete or represented by a slight bulge and twist of the thickened columella.

N. STYLODON, Pfr. Pl. 6, fig. 7.

Imperforate, finely wrinkled-striate, chestnut-brown, with a narrow, darker peripheral band; whorls $5\frac{1}{2}$; aperture sharp margined, with a long obliquely spiral columellar plication.

Diam. 13, alt 8 mill.

Mauritius.

It is *N. depressa*, Fér.; *N. monodonta*, Grat.; *N. albidens*, Benson.

N. SCALPRUM, Val. Pl. 6, fig. 8.

Narrowly perforate, striate; whorls $4\frac{1}{2}$, the last strongly keeled; columella with a small, distinct plication. Diam. 15, alt. 7·5 mill.

Habitat unknown.

N. ODONTINA, Morelet. Pl. 6, figs. 5, 6.

Narrowly umbilicated, whorls 6, rounded; light horn-color, or whitish, umbilicus with an oblique tooth. Diam. 8, alt. 6 mill.

Mauritius.

It is *N. Lightfooti*, Pfr. (fig. 6), erroneously assigned to Australia, and *N. suffulta*, Benson (fig. 5).

N. CALDWELLI, Barclay. (Unfigured.) *Mauritius.*

Section CALDWELLIA, H. Adams, 1873.

N. PHILYRINA, Morelet. Pl. 4, fig. 74.

Imperforate, very thin, membranaceous, obliquely rugulose, with very close, slight spiral lines, pellucid, greenish corneous; whorls 4, rapidly increasing, apex mucronate, suture impressed, last whorl not descending, acutely keeled; lip acute.

Diam. 17, alt. 9 mill.

Mauritius.

N. mucronata, Pfr., is a synonym.

N. IMPERFECTA, Desh. Pl. 5, figs. 81, 82.

Imperforate, thin, pellucid, light brown; whorls 5, the first two smooth, mamillate, the rest flattened, suture margined, minutely transversely striate, the last carinate.

Diam. 11, alt. 7 mill.

Isl. Bourbon, Mauritius.

N. CERNICA, H. Adams. Pl. 5, fig. 83.

Imperforate, very thin, membranaceous, obliquely longitudinally striate, minutely decussated by spiral lines, yellowish horn-color; whorls 4, apex obtuse, suture lightly impressed; last whorl acutely carinated, descending in front.

Diam. 10, alt. 8 mill. *Mauritius.*

N. BORYANA, Morelet. (Unfigured.) *Mauritius.*

Subgenus RHYSOTA, Albers, 1850.

N. VIRENS, Martens. Pl. 7, fig. 14.

Perforate, obliquely striate, the last whorl with impressed not crowded spiral lines, and rare oblique rugæ, shining, green, with a narrow obscure chestnut band at the periphery, spire convex, reddish brown, suture crenulate-striate; whorls 5, the last not deflexed. Diam. 43, alt. 29 mill.

Sumatra.

This may be *N. tumens*, Desh., a shell originally referred by Pfeiffer and others to the synonymy of *N. cidaris*, Lam.

N. LIMBIFERA, Martens. Pl. 7, figs. 15, 16.

Perforate, rather solid, striulate, with elevated, not crowded undulating spiral lines and short oblique, distant, slight rugæ; somewhat shining, yellowish or chestnut color, with a moderate peripheral band, and lighter border below it, umbilical region chestnut; whorls $5\frac{1}{2}$, suture submargined.

Diam. 36–43, alt. 25–33 mill.

Celebes.

N. ERRATICA, Hende. Pl. 7, fig. 21.

Perforate, rather thick, concentrically and spirally striate, yellowish chestnut, two-banded; columella arcuate, half covering the umbilicus; outer lip sharp. Diam. 41, alt. 27 mill.

Province of Hue-bei, China.

N. STOLEPHORA, Val. Pl. 7, fig. 17.

Subperforate, rather smooth, obliquely striate, very light reddish brown, with a broad reddish band below the peripheral angle, base lighter, reticulately striate; whorls 4.

Diam. 52, alt. 20 mill.

Philippines.

It is *N. buphthalmus*, Fér., and *N. bicolor*, Pfr.

N. SAGITTIFERA, Pfr. Pl. 7, figs. 18–20.

Subperforate, depressed, thin, pellucid, obliquely striate and obsoletely rugose; brown, with chestnut-colored arrow-shaped maculations and obsolete band at the peripheral angle; whorls $4\frac{1}{2}$, suture impressed, canaliculate at the last whorl; aperture white. Diam. 47, alt. 26 mill.

Philippines.

Var. HEPATICA, Reeve. Fig. 20.

More distinctly carinate, chestnut brown above, with a blackish band below the carina, base olive-brown, arrow-shaped maculations obscure.

Var. MAJOR, Pfr.

Thicker and larger. Diam. 67, alt. 35 mill.

N. BORNEENSIS, Pfr. Pl. 8, fig. 23.

Narrowly umbilicated, the umbilicus partly covered by the dilated columellar lip, decussately striated, chestnut-brown; whorls 4, the last one obtusely angulated on the periphery with a dark chestnut band below the angle, base sometimes irregularly strigate with chestnut. Diam. 52, alt. 25 mill.

Borneo.

N. DVITIJA, Semper. Pl. 8, fig. 24.

Subperforate, solid, shining, yellowish brown, greenish at the suture and base, closely irregularly sculptured with small rugæ, with remote concentric striæ; whorls 4, suture subplicate, periphery rounded; peristome with a narrow dark exterior marginal zone; columella subplicate or twisted.

Diam 44, alt. 26 mill.

Ins. Luzon, Philippines.

N. SOWERBYANA, Pfr. Pl. 8, fig. 25.

Subperforate, solid, somewhat shining, subdecussated by close concentric, and more distinct incremental striæ; olivaceous

brown; whorls $4\frac{1}{2}$, rapidly increasing, the last obliquely depressed, dilated in front; aperture oblique, lip white, inflexed and thickened in old specimens, the extremities connected by a parietal callus. Diam. 52, alt. 25 mill.

Caroline Islands.

The synonyms are *N. Hogoleuensis*, Le Guill., and *N. pachistoma*, Hombr. et Jacq.

N. DISTINCTA, Pfr. Pl. 8, fig. 26.

Umbilicated, rather thin, with growth-lines, and lightly impressed spiral striæ, slightly vermicularly rugose above, less distinctly so below; varying from light yellowish brown to salmon-brown, the darker colored specimens with a light band on the scarcely angulated periphery; whorls $5\frac{1}{2}$, lip thin.

Diam. 56, alt. 32 mill.

Cochin China, Siam.

N. OVUM, Val. Pl. 8, fig. 29.

Imperforate when adult, solid, obliquely striate, sparsely spirally lineate and very lightly vermiculate; yellowish brown or chestnut-brown, unicolored, or with a light band above the periphery, and a darker band below it; whorls 5, the last with an obtuse peripheral angle, above which it is obliquely depressed, suture well impressed, base excavated around the umbilicus, into which a columellar callus is deeply impressed; aperture white. Diam. 115, alt. 70 mill.

Is. of Luzon and Panay, Philippines.

It is *N. meridionalis*, Wood, *N. Otaheitana*, Fér., *N. Taheitana*, Hartm.

N. RHEA, Pfr. Pl. 9, fig. 30.

Imperforate when adult, solid, striate and with deeply impressed vermicular sulci, giving the surface a rugose appearance; chestnut-colored, darker on the base, the periphery with a light colored band, and a darker one below it; whorls 5, round-shouldered below the suture, the last obsoletely angled at the periphery, obliquely flattened above, rounded beneath; aperture white, the columellar callus deeply impressed into the umbilicus.

Diam. 69, alt. 37 mill.

Isl. Panay, Philippines.

Much more rugosely sculptured than *N. ovum*, with more shouldered whorls.

N. Mindanaensis, Semper. Pl. 9, fig. 31.

Perforate, solid, rugosely striate, brown, with a blackish peripheral line; whorls $5\frac{1}{2}$, suture impressed, first whorls plane, the last two rounded, subcarinate.

Diam. 44–57 mill., alt. 22–31 mill.

Ins. Mindanao, Philippines.

N. Basileus, Benson. Pl. 10, fig. 36.

Narrowly umbilicated, irregularly striulate, becoming folded toward the suture, with obsolete spiral sulci, more numerous on the base, and oblique rugæ; whitish, under a deciduous yellowish epidermis, with a wide chestnut band under the periphery; interior chestnut-tinged with a median white band having an inferior dark chestnut border; whorls 5, the last not descending, subangulate at the periphery. Diam. 72, alt. 36 mill.

Anamully Hills, Central India.

It is *N. Titanica*, Pfr.

N. Gervaisii, Dubrueil. Pl. 9, fig. 35.

Umbilicus small, subcallous, solid, longitudinally striate, last whorl malleate; horny-red colored, interior white; whorls 7, the last subcarinate on the periphery. Diam. 83, alt. 35 mill.

? Philippines.

N. Mulleri, Pfr. Pl. 10, fig. 37.

Scarcely umbilicated, solid, minutely rugosely reticulated, irregularly malleate; chestnut-color; base darker, red spotted below a subperipheral dark band; whorls $4\frac{1}{2}$, the last subangulate.

Diam. 39, alt. 23 mill.

Isl. Mindoro, Philippines.

Is *N. ovum*, Pfr., var.

N. maxima, Pfr. Pl. 10, fig. 38.

Narrowly perforate, solid, ponderous, irregularly striate by growth lines; chestnut brown above the periphery, with yellowish bands, various in number, wider or narrower, below the periphery dark chocolate, not banded; whorls $6\frac{1}{2}$, with deeply impressed suture, the last angulate on the periphery; aperture pale bluish, showing white bands; lower margin of lip thickened within. Diam. 90, alt. 42 mill.

Philippines.

N. Oweniana, Pfr. Pl. 10, fig. 39.

Perforate, thin, above radiately striate, decussated by very close spiral lines; yellowish brown, peripheral angle whitish, with a chestnut band below it, base greenish brown, shining with irregular spiral impressed lines; whorls $4\frac{1}{2}$, the last not descending, obtusely angulate at the periphery; columella oblique, sinuous above. Diam. 32, alt. 17 mill.

Philippines.

N. Lamarckiana, Lea. Pl. 10, figs. 40, 41.

Obliquely perforate, rather thin, rugosely striate, crossed by impressed spiral lines, obliquely obsoletely rugulose; yellowish brown above, periphery lighter, with a chestnut band below it, base olivaceous brown; whorls $4\frac{1}{2}$, the last not descending, periphery angulated. Diam. 60, alt. 32 mill.

Philippines.

Var. caducior, Reeve. Fig. 41.

Shell smaller, thinner, lighter colored, more acutely angulated. Diam. 55, alt. 24 mill.

N. Antonii, Semper. Pl. 11, fig. 44.

Covered perforate, solid, with incremental and spiral impressed striæ, and slight oblique rugæ; olivaceous brown, irregularly strigate, the periphery dark chocolate, base more shining; whorls $4\frac{1}{2}$, suture white-bordered, last whorl with obsolete peripheral angle; lip somewhat thickened. Diam. 62, alt. 30 mill.

Ins. Luzon.

N. porphyria, Pfr. Pl. 10, fig. 42.

Imperforate when adult, moderately solid, obliquely rugosely striate, with impressed spiral lines visible principally on the base; light reddish brown with yellowish white irregular callous deposits on the upper part forming a marbled or obliquely verrucose raised ornamentation; a brown band below the periphery, base olivaceous brown, shining; whorls $4\frac{1}{2}$, the last angulated at the periphery, excavated around the umbilicus.

Diam. 43, alt. 26 mill.

Isle of Burias, Philippines.

N. Zeus, Jonas. Pl. 11, fig. 46.

Obliquely perforate, solid, with oblique rugæ and elevated spiral striæ; reddish, ornamented above with zigzag white

streaks, dark banded below the periphery, and deeply spirally grooved; whorls $4\frac{1}{2}$, the last angulated on the periphery.

Diam. 60, alt. 30 mill.

Isl. Mindoro, Philippines.

Is possibly an extreme variety of the preceding species.

N. Uranus, Pfr. Pl. 11, fig. 45.

Perforation covered, closely slightly striate, with unequal slight concentric striæ; olivaceous brown, whorls $4\frac{1}{2}$, the last strongly angulated. Diam. 68, alt. 28 mill.

Ins. Polillo, Philippines.

N. Martini, Pfr. Pl. 10, figs. 43, 47.

Narrowly umbilicated, rather thin, closely obliquely granularly striate; light chestnut-brown, often tinged with olivaceous on the spire and base; whorls 7–8, slowly increasing, periphery acutely angulated. Diam. 35–43, alt. 16–21 mill.

Pedang, Isl. of Sumatra.

N. Mackensiana, Souleyet, and *N. Balesteriana*, Lea, are both sinistral shells, and the former has been placed by me in the synonymy of *Ariophanta Janus;* but Pfeiffer considers them identical with the present species. *N. amphidroma*, Martens, is said to be both dextral and sinistral; the dextral form, at least (fig. 47), may be considered a smaller variety of the present species.

N. Ribbei, Böttger. Pl. 10, fig. 48.

Moderately umbilicated, arcuately striate; yellowish brown under a deciduous epidermis; whorls $5\frac{1}{2}$, the last not descending, with acutely carinate, plicate periphery, radiately striate on the base; extremities of the lip connected by a parietal callus.

Diam. 26, alt. 11 mill.

Celebes.

N. pernobilis, Fér. Pl. 8, fig. 28.

Umbilicated, smooth, rather thin, decussately striate, and very slightly malleate; olivaceous brown; whorls $5\frac{1}{2}$, suture well-impressed, periphery subangulate; interior bluish white.

Diam. 65, alt. 42 mill.

Siam.

The figure of this species in Férussac is not recognizable, so that Pfeiffer's identification of it with the Siam form, as given

N. RUGATA, Martens. Pl. 9, figs. 32, 33.

Narrowly perforate, closely rugose, and minutely granulose above; reddish brown, with a white peripheral band, sometimes reappearing on the spire; whorls 6, the last not deflected in front, obtusely angulated on the periphery.

Diam. 48, alt. 32 mill.

Celebes, Timor.

This is *N. cidaris* (fig. 32), of Gray and Pfeiffer, not Lamarck, and *N. Clairvillia* of Reeve (fig. 33), not Férussac.

N. MUMIA, Hombr. et Jacq. Pl. 11, fig. 51.

Narrowly umbilicated, irregularly striate above and with spiral lines on the last whorl, base regularly striate; brown, with a yellowish band above the periphery, below it lighter colored; whorls $5\frac{1}{2}$; columellar lip reflected, having a dentiform plication.

Diam. 45, alt. 25 mill.

Habitat unknown.

N. HUMPHREYSIANA, Lea. Pl. 11, figs. 52, 53; Pl. 12, fig. 54.

Openly umbilicated, decussated and minutely granulosely rugose above, below without rugæ; yellowish brown, with a chestnut peripheral band; whorls 6–7. Diam. 53, alt. 33 mill.

Pondichery, Singapore, Sumatra.

N. nobilis, Reeve, is a synonym.

Var. GEMINA, von dem Busch. Fig. 54.

Umbilicus narrower, periphery yellowish brown, with a chestnut band above and another below it.

Java.

Var. COMPLANATA, von Martens. Fig. 53.

Shell more depressed, the whorls less convex.

N. UNDOSA, Blanford. Pl. 12, fig. 55.

Narrowly umbilicated, rather solid, growth-lines oblique, rugose, with irregular sinuous spiral striæ above the periphery; straw-color, sometimes stained darker on the spire, and around the umbilicus; whorls 5, the last with subplicate carina on the periphery. Diam. 36, alt. 21 mill.

Ava.

The only figure published (copied above) has the growth-lines much more rugose than in the type, whilst the spiral sculpture is obsolete; it is an extreme variety at least.

N. Pluto, Pfr. Pl. 12, fig. 56.

Umbilicated, rather solid, above spirally and obliquely minutely striate, below with subundulating spiral striæ around the umbilicus; chocolate brown, often indistinctly lighter banded, extending below the periphery, most of the base yellowish brown; aperture similarly colored; whorls $5\frac{1}{2}$, the last distinctly angulated above the middle.

Diam. 61, alt. 30 mill.

Cambodia.

N. Rosamonda, Benson. Pl. 12, fig. 57.

Perforate, rather thin, arcuately rugosely striate, with close granulated lines above, decussated below by obsolete spiral striæ; orange-brown, or olivaceous yellow becoming brown on the spire; whorls $5\frac{1}{2}$, suture submargined, periphery obsoletely angulated and subplicate. Diam. 37, alt. 24 mill.

Ceylon.

N. nobilis, Pfr. Pl. 12, fig. 58.

Narrowly umbilicated, rather solid, striate, decussated by spiral and oblique impressed lines; orange-brown, with a narrow chestnut band below the periphery, lighter colored around the umbilicus; aperture bluish white; whorls 6, the last with a narrow peripheral carina. Diam. 53, alt. 30 mill.

Borneo.

N. Herklotsiana, Dohrn. Pl. 12, fig. 59.

Umbilicated, rather thin, closely obliquely and distantly spirally striate above; reddish brown or yellowish brown, fading to whitish on the base, the periphery with a narrow yellowish band, bordered below with dark chestnut, the latter sometimes appearing at the suture; whorls $5\frac{1}{2}$, the last subangulate on the periphery. Diam. 38, alt. 22 mill.

Java.

N. bulla, Pfr. Pl. 12, figs. 60, 61.

Subperforate; very thin, pellucid, very minutely decussated by close, spiral and oblique striæ; light yellowish brown, with a chestnut band on the periphery; whorls 4, the last angulated on the periphery; interior unifasciate; upper margin of aperture inflexed. Diam. 40, alt. 23 mill.

Ins. Luzon, Philippines.

It is *N. vesica*, Pfr.

N. Chenui, Pfr. Pl. 12, fig. 62.

Subperforate, rather thin, malleate, with subrugose incremental and impressed spiral striæ; yellowish- or olivaceous-brown, with a light narrow peripheral band and a chestnut band below it; whorls $4\frac{1}{2}$, a little rugose at the suture, the last obtusely angulate at the periphery. Diam. 40, alt. 20 mill.

Ceylon.

N. Beddomei, Blanford. Pl. 12, fig. 63.

Openly perforate, rather thin, decussated by oblique striæ and spiral lines, obliquely shortly sulcate above; smoother and shining below, with radiating, and small subspiral impressed lines; corneous-white, or light brownish, with a wide chestnut band below the periphery, becoming yellowish or whitish on the base; whorls $4\frac{1}{2}$, the last obtusely angulated; aperture opaline, brownish, with the chestnut band. Diam. 50, alt. 24 mill.

Travancore, Southern India.

More openly perforate, more angulated on the periphery than *N. Chenui;* the sculpture, though generally similar, shows marked distinctions.

N. Sisparica, Blanford. Pl. 13, fig. 64.

Openly, narrowly umbilicated, rather thin, striate; yellowish brown; whorls 4, suture linear, submargined, periphery of last whorl obtusely angulated; aperture white, opaline.

Diam. 37, alt. 18 mill.

Sispara ghat, Nilgiri hills, Central India.

N. Cuvieriana, Lea. Pl. 13, figs. 65, 66.

Subperforate, thin, pellucid, decussated above by growth-lines and close spiral striæ, smooth and shining below; yellowish olivaceous, narrowly chestnut banded below the carina, base darker colored; whorls 5, flattened above, convex below.

Diam. 32, alt. 14–15 mill.

Ins. Luzon, Philippines.

N. exilis, (Müller?) Pfeiffer. Pl. 13, figs. 67, 68.

Perforate, carinate, thin, pellucid, sharply striate above, the base smoother; light yellowish brown, with a narrow chestnut band below the periphery, and chestnut tinged around the umbilicus; whorls 6, the last angulated on the periphery.

Diam. 35, alt. 15 mill. *Philippines* (Cuming).

N. EXPLANATA, Quoy and Gaimard, Pl. 13, fig. 69.

Perforate, thin, closely obliquely striulate, mingled with wider striæ, smoother below; reddish brown, lighter below; becoming whitish towards the centre; whorls 6, the last acutely carinated on the periphery, with a narrow chestnut band below.

Diam. 30, alt. 12 mill.

New Guinea.

The *N. exilis* of Müller is indeterminable, but Pfeiffer and others have identified it with a shell brought by Cuming from the Philippine Islands, and have included as a synonym *N. explanata*, Quoy and Gaimard. The two species are distinct, although very similar in their characters, as pointed out by Dr. von Martens.

N. DIVISA, Forbes. Pl. 13, fig. 70.

Perforate, rather thin, obliquely striate above, obsoletely decussated by impressed lines, base smoother, shining; orange brown, lighter around the umbilicus; whorls 5, the last with a compressed carina on the periphery, suture margined.

Diam. 24, alt. 9·5 mill.

Louisiade Is.

N. HAUGHTONI, Benson. Pl. 17, fig. 51.

Perforate, rather solid, irregularly obsoletely plicatulate above, crossed by very fine spiral striæ, smoother below; olivaceous brown, interior of aperture flesh brown; whorls $4\frac{1}{2}$–5, suture thread margined, shortly plicate, last whorl obtusely slightly angled on the periphery, and again around the umbilicus; columellar lip oblique, slightly callously dentate.

Diam. 31, alt. 19 mill.

Andaman Is.

N. Chambertinii, Tryon, is a synonym.

N. NOVÆ-HIBERNIÆ, Quoy. Pl. 13, fig. 73.

Narrowly perforate, thin, rugulosely obliquely striate above and slightly malleated, smoother but microscopically malleated and spirally lineated below; light brownish, with a narrow chestnut line, bordered below by a yellowish line on the periphery, base very light yellowish brown; whorls 6, the last obtusely angulated on the periphery. Diam. 19, alt. 10 mill.

New Ireland.

N. Cartereti, E. A. Smith. Pl. 13, figs. 71, 72.

Narrowly perforate, rather solid, with oblique growth-lines and minute microscopic spiral striæ; fulvous brown above, paler below, whorls 7, the last obtusely angular at the periphery, and peculiarly narrowed a little behind the aperture; aperture flesh-tinted within. Diam. 22, alt. 15 mill.

Wild Isl., Admiralty Archipelago.

Differs from the preceding species in having no band on the periphery and in the narrowing of the last whorl.

N. Darondeaui, Souleyet. Pl. 13, fig. 74.

Umbilicated, obliquely rugose, spirally striated; olivaceous brown, chestnut-colored beneath; whorls five, the last strongly carinate, carina lighter colored; aperture light chestnut, with a yellowish band. Diam. 41, alt. 19 mill.

Ins. Luzon, Philippines.

N. Souleyetiana, Pfr. Pl. 13, fig. 75.

Perforate, rather solid, rugosely striated above, very closely but slightly undulately lineate between the striæ; light brown, with a deeper brown band below the periphery, base brownish white. Diam. 42, alt. 18 mill.

Borneo.

N. Donovani, Pfr. Pl. 13, fig. 76.

Perforate, thin, diaphanous, striate, very minutely decussated above by oblique lines; yellowish brown, the peripheral angle whitish with a narrow chestnut band below it, base brownish white; whorls $5\frac{1}{2}$, the last angulated on the periphery; interior opaline, showing the bands. Diam. 47, alt. 21 mill.

Borneo.

Very closely allied to the preceding species.

N. isabellina, Pfr. Pl. 13, fig. 77.

Perforate, thin, very minutely granulately rugulose, pellucid; light yellowish or flesh-color; whorls 5, the last acutely carinated. Diam. 33, alt. 14 mill.

Ceylon.

N. acuducta, Benson. Pl. 13, fig. 81.

Perforate, thin, costulately striate, granulately decussated by very close impressed lines, smooth below, with impressed spiral

striæ; light yellowish brown; whorls 5, the last narrowly carinate on the periphery. Diam. 22, alt. 11 mill.

Nilgherry Mts., Central India.

I suspect that this will prove identical with the last species; if so, it has priority in date of description.

N. TRAVANCORICA, Benson. Pl. 13, fig. 78.

Narrowly perforate, thin, very sharply decussated above by close granular spiral striæ and very close oblique growth-lines, smoother and polished below, with obsolete spiral striæ towards the umbilicus; very light yellowish brown; whorls $5\frac{1}{2}$, suture narrowly margined, last whorl with a strong, narrow, whitish peripheral carina, base convex. Diam. 29, alt. 15 mill.

Travancore, India.

N. CENTRALIS, Mousson. Pl. 13, figs. 79, 80.

Narrowly perforate, minutely striate, very minutely granulose; cinnamon-color, lighter on the carina; whorls $6\frac{1}{2}$, the last with sharp, peripheral angulation. Diam. 22, alt. 12 mill.

Java.

N. CERARIA, Benson. Pl. 13, fig. 82.

Covered perforate, shining, radiately rugosely striate, decussated by rather remote spiral striæ; whorls 4, the last carinate on the periphery; light yellowish brown, becoming orange-brown on the spire; extremities of the lip united by a thin parietal callus. Diam. 20, alt. 10 mill.

Ceylon.

N. RIEDELII, Martens. Pl. 13, figs. 83–86.

Scarcely perforated, thin, striulate, with close, slight spiral lines above, shining below; whorls 4, slightly margined at the suture; yellowish, lighter on the peripheral angle.

Diam. 19, alt. 12 mill.

Celebes.

This is *N. securiformis*, Mouss. not Deshayes.

N. NOVELLA, Pfr. Pl. 14, fig. 88.

Perforate, rather thin, diaphanous, lightly rugosely striate; orange-brown, lighter on the carina; whorls 5, suture submargined. Diam. 21·5, alt. 12·5 mill.

Ceylon.

Too close to *N. ceraria*, Benson, described above, as well as to the following species.

N. INDICA, Pfr. Pl. 23, fig. 46.

Perforate, rather solid, striæ rib-like above, and closely granulately decussated with impressed lines, smooth below, except a few spiral lines near the keel; yellowish brown; whorls 5–6, the last carinate on the periphery. Diam. 23, alt. 14 mill.

Nilgherry Mts., Central India; Australia (introduced).

N. VARIOLOSA, Pfr. Pl. 14, fig. 87.

Perforate, rather solid, opaque, very closely plicate above, decussated by regular concentric lines; orange-brown above, yellowish brown below, subfasciately ornamented with white, obliquely subquadrangular pustules; whorls $3\frac{1}{2}$, the last sharply carinated on the periphery. Diam. 23, alt. 13 mill.

Hab. unknown.

This shell is certainly not adult.

N. CYMATIUM, Benson. Pl. 14, fig. 89.

Umbilicated, solid, thinly striated and minutely obliquely rugulose; reddish brown, lighter on the base; whorls $6\frac{1}{2}$, suture chestnut-margined, the last whorl with a compressed peripheral carina, lighter colored, with a chestnut band below it; base spirally striate, umbilicus large. Diam. 45, alt. 21 mill.

Malacca, Penang.

N. CHEVALIERI, Souleyet. Pl. 14, fig. 90.

Umbilicated, rugulose above; olivaceous brown, base lighter; whorls 6, the last narrowly carinated on the periphery and chestnut-banded; aperture banded within.

Diam. 37, alt. 20 mill.

Malacca.

Less conical, whorls more rapidly enlarging, umbilicus smaller than in the preceding species.

N. DENSA, Ads. and Reeve. Pl. 14, figs. 91–93.

Narrowly umbilicated, moderately solid, striate, minutely granulose above, smoother below; light yellowish or orange-brown; whorls $5\frac{1}{2}$, last whorl acutely angulated on the periphery, with a narrow chestnut band below the angle.

Diam. 40, alt. 20 mill.

Philippines.

N. Schumacheriana, Pfr. Pl. 14, fig. 94.

Chestnut-colored, slightly larger with more compressed carina than the last species, chestnut-banded below the carina.

Diam. 44, alt. 22 mill.

Borneo.

This is *N. densa*, var. β of Pfeiffer, but subsequently separated by him as above. Dr. von Martens unites it with *densa* as a variety, adding as different varieties *N. atrofusca*, Albers (= typical *Schumacheriana*), var. *ignobilis* (= typical *densa*), *N. Herklotsiana*, Dohrn, p. 37; *N. Moussoniana* (= *N. corrosa*, Mousson), var. *Lowiana*.

N. semidecussata, Pfr. Pl. 17, fig. 52.

Narrowly perforate, rather thin, striate, very distinctly decussated above by fine spiral lines, smooth and slightly shining below; fulvous-brown; whorls 7, the last obtusely plicately carinate at the periphery. Diam. 33, alt. 18 mill.

Ceylon.

N. Weinkauffiana, Crosse. Pl. 17, fig. 48.

Narrowly perforate, rather solid, arcuately finely striate, with obsolete, impressed spiral lines; yellowish brown, becoming nearly white around the umbilicus; whorls 6, the last with acutely angulated periphery; lip slightly thickened, white.

Diam. 29, alt. 13 mill.

Cochin China.

N. Crossei, Pfr. Pl. 17, fig. 47.

Very narrowly perforate, moderately solid, closely, finely arcuately striate above, obsoletely decussated by spiral lines, smooth and polished below; whorls $6\frac{1}{2}$, yellowish white, the last slightly descending at the aperture, obtusely angulated on the periphery, becoming nearly white around the umbilicus; lip slightly thickened within, white. Diam. 28·5, alt. 17 mill.

Siam.

Varieties occur in Cochin China of darker color, fulvous chestnut. Less depressed and more obtusely angulated than the preceding species.

N. semiglobosa, Pfr. Pl. 14, fig. 95.

Subperforate, rather thin, very minutely decussately granulate above, smooth and shining below; yellowish brown, with a chest-

nut band below the carina; whorls 6, the last with strongly angulated periphery. Diam. 44, alt. 26 mill.

Ins. Leyte and Samar, Philippines.

A variety has the last whorl more inflated, and is darker colored. Closely allied to the next species, but the shell is thinner, spire more convex, carina obtuse, the umbilicus not closed, etc.

N. Panayensis, Brod. Pl. 14, figs. 96, 97.

Imperforate, moderately thick, body-whorl concave above the carina, very minutely granularly decussated by close impressed spiral lines and close growth-lines; yellowish or orange-brown or light-chestnut above, darker and olivaceous below, smooth and shining; whorls 6, peripheral carina acute.

Diam. 44, alt. 21 mill.

Ins. Panay, Philippines.

The darker colored variety, with somewhat higher spire, occurs on the Island of Luzon.

N. Blainvilleana, Lea. Pl. 15, figs. 1, 2.

Narrowly perforate, sometimes covered in the adult, moderately thin, very finely decussately granular above, smooth and polished below; olivaceous brown, dilutely darker banded below the periphery; whorls 6, the last strongly angulated, base usually darker colored. Diam. 36, alt. 20 mill.

Ins. Labuan, Philippines.

Generally known as *N. semigranosa*, Sowerby, but Dr. Lea's name has clear priority, and I am glad to have the opportunity of restoring it. Dr. Lea was one of the pioneers in opening up to science a knowledge of the many beautiful terrestrial and fluviatile mollusks of the East Indies and Philippines, and he did his work well, both by description and illustration, yet his labors have been slightingly treated by European naturalists, and often ignored.

N. Moussoni, Semper, is a synonym.

N. compluviata, Cox. Pl. 14, fig. 100.

Umbilicus narrow, shell thin, smoothish; chestnut-color, lighter on the carina and around the umbilicus; whorls 6, the last with

acute carina, slightly sulcate above it, the sulcus continuing on the spire-whorls. Diam. 28, alt. 18 mill.

Solomon Islands.

Placed by Pfeiffer in this group, but scarcely belonging to it.

N. TINOSTOMA, Blanford. Pl. 14, fig. 99.

Narrowly umbilicated, closely decussated, with fine spiral striæ, and growth-lines, smoother beneath; yellowish brown above, paler below, with a narrow pale line just above and a dark line just below the periphery; whorls 5, the last scarcely angular on the periphery; aperture peculiarly compressed above and below, transverse, peristome slightly inflexed above.

Diam. 50, alt. 21 mill.

Near Travancore, India; alt. 5000 ft.

N. ENISA, Blanford. Pl. 14, fig. 98.

Umbilicated, subgranularly decussated above, formed by growth striæ and fine spiral lines, the latter disappearing near the umbilicus on the smoother base; yellowish chestnut, paler and dull yellow below around the umbilicus, with a faint pale peripheral band; whorls $4\frac{1}{2}$, the last slightly angulate on the periphery, depressed above at the aperture. Diam. 43, alt. 20 mill.

Travancore, India.

N. GORDONIÆ, Benson. Pl. 15, figs. 3, 4.

Perforate, thin, obliquely plicatulate and very minutely striate above, smoother below, somewhat shining, radiately striate and distantly decussate; corneous white; whorls 7, widely margined at the suture, sharply compressed-carinate at the periphery; lip a little thickened within, white. Diam. 33, alt. 11 mill.

Moulmein, Burmah.

N. CLEAMESI, E. A. Smith. Pl. 28, figs. 4, 5.

Narrowly perforate, thin, semitransparent, the curved growth-lines are crossed and granulated above by fine concentric striæ, below more finely concentrically striated, more glossy and not granulated; vinous horn-color; whorls 6, the last carinate, the carina less marked near the aperture. Diam. 26, alt. 17 mill.

Madagascar.

Unfigured and Doubtful Species.

N. DANÆ and N. DURA, Pfr. — *Lao Mts., Cambodia.*

N. ARGUTA, Pfr. — *Tenga Hills, Java.*

N. Fordei, Brazier. *Mt. Wellington, Tasmania.*
N. inclinata, Pfr. *Louisiade Is.*
N. Egbertiæ, Martens. *Taburi, S. East New Guinea.*
N. Menadensis, Mousson. *Celebes.*
N. declivis, Pfr. (*N. Tritoniensis*, Le Guillou).
Triton Bay, N. Guinea.

Section Euplecta, Semper, 1870.

N. Boholensis, Pfr. Pl. 23, figs. 47, 48.

Imperforate, thin; corneous white, closely regularly striate above, with two acute elevated spiral lines at the suture, striulate below; whorls 7, the last with acutely carinated periphery. Diam. 10–14, alt. 4–6 mill.

Ins. Bohol, Philippines.

N. Armida, Pfr. Pl. 23, fig. 49.

Subperforate, rather thin, minutely striatulate, diaphanous, slightly shining, light brown; whorls 6, suture with white margin, last whorl with a short whitish peripheral carina. Diam. 16, alt. 8 mill.

Ins. Luzon, Philippines.

N. biangulata, Pfr. Pl. 23, fig. 50.

Subperforate, thin, lightly striate and a little shining; yellowish white; whorls 7, slowly enlarging, spire gradate, last whorl bicarinate, the upper carina showing on all the whorls, the lower one thread-like on the periphery. Diam. 15, alt. 9 mill.

Ins. Luzon, Philippines.

N. filocincta, Pfr. Pl. 23, fig. 51.

Narrowly perforate, thin, pellucid, striulate, shining; corneous white; whorls $5\frac{1}{2}$, with a thread-like peripheral carina, margining the suture above. Diam. 11, alt. 5·5 mill.

Ins. Mindanao, Philippines.

This is the type of *Inozonites*, Pfeffer, which appears to agree with *Euplecta*, except that the mucous pore is said to be without horn.

N. bicarinata, Semper. Pl. 23, figs. 52, 53.

Perforate, or covered, thin, striate, above the suture with two approximating carinæ; whorls 6–$6\frac{1}{2}$, the lower carina becoming obsolete on the last. Diam. 12·5, alt. 5–7 mill.

Ins. Luzon, Philippines.

N. ORTHOSTOMA, Pfr. Pl. 23, figs. 54–56.

Umbilicated, closely arcuately striate above, thin, pellucid, light corneous; whorls 6, narrow, base smoothish.

Diam. 10, alt. 5 mill.

Ins. Panay, Philippines.

A doubtful number of the group.

N. ROTUNDATA, Semper. (Unfigured.) *Ins. Luzon, Philippines.*

Section ROTULARIA, Mörch, 1852.

N. MASSONI, Behn. Pl. 23, figs. 57, 58.

Perforate, moderately solid, lightly rugulosely striate, and slightly decussated, somewhat shining; olivaceous brown; whorls 5, suture margined, the two last whorls impressed above the carina, the last not descending, base shining.

Diam. 18, alt. 8 mill.

Nicobar Islands.

N. REINHARDI, Mörch.

Differs from the above in being smaller (diam. 6 mill.), umbilicus wider, spire more elevated, carina narrower, and want of spiral lines. Nevill makes this a variety of *N. Massoni;* it has not been figured, but unless a young shell, it would appear to have sufficient distinctive characters.

N. FRAUENFELDI, Zelebor. (Unfigured.) *Nicobar Islands.*

Section TROCHONANINA, Mousson, 1869.

N. SCHMELTZIANA, Mousson. Pl. 23, fig. 59.

Imperforate, thin, pellucid, shining above, polished below; yellowish horn-color; whorls $5\frac{1}{2}$, plane above, convex below, the last acutely angulated on the periphery. Diam. 7, alt. 4 mill.

Ins. Upolu.

Var. USURPATA, Mousson.

Elevately conical, darker, carina less acute, columellar margin less callous and nodulous.

Ins. Savai.

N. EXPOSITA, Mousson. Pl. 23, fig. 60.

Imperforate, scarcely shining above, polished below, striulate, chestnut-colored, radiately subfasciate; whorls $4\frac{1}{2}$–5, flattened above, a little excavated at the peripheral carina, base radiately

and sinuously indistinctly fasciate; columellar lip slightly sinuous, callously reflexed and adnate at the insertion.

Diam. 7, alt. 4–4·5 mill.

Sunday Island, Kermandec Archipelago.

N. Tais, Hombr. et Jacq. Pl. 23, fig. 61.

Imperforate, thin, distinctly striate and very obsoletely decussated by spiral lines above, smoother and more shining below; yellowish corneous or brownish, lighter colored below; whorls 6, the last acutely angulated on the periphery.

Diam. 13, alt. 7 mill.

Marquesas Is.

N. tropidophora, Ad. and Rve. Pl. 23, fig. 62.

Imperforate, distinctly striulate with obsolete decussating spiral lines above, below smoother and more shining; dark brown, lighter below; whorls $5\frac{1}{2}$–6, the last bearing an acute peripheral carina, slightly concave above and below it.

Diam. 11·5, alt. 7 mill.

Borneo.

N. insculpta, Pfr. Pl. 23, figs. 63–65.

Imperforate, moderately solid, above closely costulate, with impressed spiral lines parallel with the carina, base smooth, with impressed lines next the carina; whorls 5, the last with a sharp peripheral angle; columella with a short white tooth.

Diam. 8, alt. 4 mill.

Ins. Norfolk? Siam.

N. basiodon, Morelet, is a synonym.

N. conicoides, Metcalfe. Pl. 23, figs. 66–68.

Imperforate, rather thin, striulate, with obsolete concentric raised striæ at the carina, somewhat shining, polished below; yellowish brown; whorls 7, compressed at the peripheral carina, which is acute, with a brown line below it, sometimes obsolete.

Diam. 18, alt. 8 mill.

Borneo.

Var. Labuanensis, Pfr. Figs. 67, 68.

Spiral raised striæ more distinct, shell more depressed, with more acute carina, suture margined. Diam. 16·5, alt. 6 mill.

Ins. Labuan.

N. vitrea, Bonnet, is a synonym.

N. SYLVANA, Dohrn and Semper. Pl. 23, figs. 69, 70.

Imperforate, rather thin, obliquely striate and slightly, very minutely spirally lirate above, polished below; horn-colored, with a brown thread at the suture; whorls 7–8, apex pellucid, last whorl acutely carinate, the carina sometimes appearing on the spire, the upper whorls being slightly exserted.

Diam. 18, alt. 7 mill.

Ins. Mindanao, Philippines.

N. CALCULOSA, Gould. Pl. 23, fig. 71.

Hyaline, fragile, shining, smooth, imperforate; light yellowish brown; whorls 4, the last obtusely angulated and narrowly carinated on the periphery. Diam. 2·5–4·5 mill., alt. 2–4 mill.

Viti and Marquesas Is.

N. OBCONICA, Pease. Pl. 23, figs. 72–74.

Narrowly perforate, thin, subpellucid, closely obliquely striate; corneous; whorls 6, lightly margined, the last acutely carinated on the periphery. Diam. 7, alt. 4·5 inches.

Raiatea, Society Islands.

N. SUBRUGOSA. Garrett. Pl. 23, fig. 75.

Imperforate, thin, subpellucid, fulvous, upper surface closely plicately striate, base smooth, glossy, umbilical region indented; whorls 4–4½, slowly increasing, the last with a thread-like keel.

Diam. 2·5, alt. 2 mill.

Tahiti and Moorea, Society Islands.

N. TAHITENSIS, Garrett. Pl. 23, fig. 76.

Subperforate, thin, subpellucid, with fine sharp oblique elevated striæ above, base smooth, glossy; whorls 4½, spire dome-shaped, suture margined above by the peripheral keel, which is prominent and thread-like on the last whorl. Diam. 2·5, alt. 2 mill.

Tahiti, alt. 2000 ft.

N. CONULA, Pease. Pl. 23, figs. 77, 78.

Imperforate, thin, upper whorls with subdistant revolving striæ, obsolete in the last, base more slightly radiately striate; whorls 5, the last with peripheral carina; columella thickened, twisted, with a basal dentiform process. Diam. 7, alt. 5 mill.

Tahiti, Rarotonga.

This is *N. Tongana*, Schmeltz, not Quoy.

N. Lychnia, Benson. Pl. 24, fig. 79.

Imperforate, thin, translucent, polished, lightly striulate; brownish or greenish brown; whorls $6\frac{1}{2}$, narrow, suture margined, last whorl acutely compressly carinate at the periphery. Diam. 12, alt. 5·5 mill.

Malacca, Nilgherry Mts. India.

Section Martensia, Semper, 1870.

N. Mozambicensis, Pfr. Pl. 24, fig. 80.

Perforate, rather thin, with close thread-like striæ, shining; light reddish brown, base often yellowish gray, somewhat marbled; whorls 5–6, suture submarginate, the last with a white peripheral angle. Diam. 12–17, alt. 6·5–8 mill.

Mozambique.

Var. albopicta, Martens.

Finely undulately obscurely radiated with white.

Bourguignat (Helixarionidæ, p. 7) thinks that the larger form as described by von Martens does not belong to this species.

N. pyramidea, Martens. Pl. 24, figs. 82–84, 81.

Perforate, irregularly striulate, light brownish horn-color above, periphery white, diaphanous whitish below; whorls 6, suture slightly margined, periphery scarcely angulated.

Diam. 18, alt. 13 mill.

E. Africa.

Var. leucographa, Martens. Fig. 81.

Radially interruptedly striated and spirally banded with white.

N. plicatula, Martens. Pl. 24, figs. 85, 86.

Perforate, rugosely striate above, below lightly striulate; variegated with white and corneous brown, base whitish; whorls 5, the last with obtusely angulated periphery.

Diam. 11, alt. 7 mill.

Zanzibar.

N. Jenynsi, Pfeiffer. Pl. 24, figs. 87, 88.

Subperforate, striulate, thin, shining; milk white, with a chestnut line above the carina; whorls $5\frac{1}{2}$, the last with obtusely angulated periphery; lip nearly closing the perforation.

Diam. 12, alt. 7·5 mill.

Zanzibar, and between *L. Nyassa* and the *East Coast*. It is said also to inhabit *Java* and *New Hebrides*.

N. DUBIA, Taylor. (Unfigured.) *Zanzibar.*
N. PELIOSTOMA, Martens. (Unfigured.) *Barava, N. of Zanzibar.*
N. ALFIERIANA, Soleillet. (Unfigured.) *E. Africa.*
N. FORMOSA, N. MEGASTOMA, N. INSIGNIS, N. UNIZONATA, N. ANCEYI, all of Bourguignat. (Unfigured.) *E. Africa.*

Section ZINGIS, Martens, 1878.

N. RADIOLATA, Martens. Pl. 24, figs. 89–91.

Rimate, thin, rather distantly radiately plicate-striæ; brownish horn-color, with close, interrupted, whitish rays, and a chestnut band on the periphery; whorls 5, periphery rounded.

Diam. 13, alt. 9·5 mill.

Zanzibar.

Section TROCHOZONITES, Pfeffer, 1883.

N. PERCARINATA, Martens. Pl. 24, figs. 92–94.

Perforate, thin, decussated above by oblique striæ and very slight spiral lines; opaque, reddish brown; whorls 7, acutely carinated on the periphery, suture channeled and with an impressed line above the carina; base yellowish brown, shining.

Diam. 11·5–15 mill., alt. 8–10 mill.

Bonjongo, W. Africa.

N. IBUENSIS, Martens. Pl. 24, figs. 95, 96.

Subperforate, thin, very finely obliquely striated, pellucid; brownish horn-color; whorls 7, the last sharply thread-keeled, base smoothish. Diam. 13 mill., alt. 10 mill.

Ibu and Bonjongo, W. Africa.

N. TUMIDULA, Martens. Pl. 24, fig. 97.

Perforated, rather thin, obliquely striate, and very lightly decussated, shining; reddish brown, light banded; whorls 7, the last minutely carinate on the periphery. Diam. 14, alt. 6·5 mill.

Bonjongo, W. Africa.

N. CALABARICA, Pfr. Pl. 24, figs. 99–1.

Perforate, thin, smoothish, diaphanous, above with 6 sharp, thread-like, spiral liræ; corneous, whitish on the base; whorls 6, the last acutely carinate. Diam. 9·5, alt. 4·5 mill.

Old Calabar, W. Africa.

N. FOLINI, Morelet. Pl. 24, fig. 98.

Perforate, thin, distantly costate above, subdiaphanous,

slightly shining, smooth and shining below; whorls 7, the last acutely carinated. Diam. 9·3, alt. 7 mill.

Prince's Isl., Guinea.

N. TALCOSA, Gould. Pl. 24, fig. 2.

Scarcely perforate, rather thin, striate, with four subacute spiral liræ; light corneous; whorls $6\frac{1}{2}$, suture subchanneled, carinate-margined, the last whorl with acute peripheral carina, base convex. Diam. 7, alt. 6·75 mill.

Cape Palmas, Liberia.

N. ADANSONIÆ, Morelet. Pl. 24, fig. 3.

Perforate, thin, corneous brown, obliquely closely costulate above, smooth below; whorls $6\frac{1}{2}$, the last with sharp peripheral angle. Diam. 6, alt. 6 mill.

Gabon Country, W. Africa.

N. PALMARUM, Morelet. (Unfigured.) *Cape Palmas, W. Africa.*
N. BIFILARIS, Dohrn. (Unfigured.) *Liberia.*

Section SITALA, H. Adams, 1856.

The grouping of the species is as far as possible that given by Godwin-Austen in the second part of his "Land and Freshwater Shells of India."

A. *Shell small, pyramidal, closely umbilicated, keeled, more or less flat below, with four or more spiral ribs on the whorls; columellar margin simple, more or less oblique; spire with flat sides; apex acuminate.*

N. INFULA, Benson. Pl. 24, figs. 4, 5.

Yellowish corneous, thin, 5–7 striate with distant lines above, smooth below and more shining; whorls 6.

Diam. 8, alt. 7 mill.

Lower Bengal.

It is *Helix turbiniformis*, Benson, not Pfeiffer.

N. ATTEGIA, Benson. Pl. 24, figs. 6, 7.

Thin, striulate, with 6 remote, scarcely elevated spiral liræ, and very minute intermediate striæ; corneous, pellucid; whorls 7, the last thread-carinated.

Diam. and alt. 8 mill. to Diam. 10, alt. 7·5 mill.

Ava, Pegu, Mulmain.

N. Culmen, Blanford. Pl. 24, fig. 8.

Very minutely perforated, very thin, horny, translucent above, with about nine fine raised spiral lines, minutely decussately striated below; whorls 6, sharply keeled at the periphery of the last whorl. Diam. 5·75, alt. 5·5 mill.

Pegu.

"Easily distinguished from *N. confinis* and *N. Attegia* by its smaller size and higher spire, from *N. arx* by the sides of the spire being straight and not concave, and from the Bengal *N. infula*, Bens., by its sculpture, and its sharper keel."

N. confinis, Blanford. Pl. 24, fig. 9.

Minutely perforated, very thin, whitish horny; whorls 7, with four or five spiral ribs and fine oblique lines of growth, the last sharply keeled, and very finely radiately striated below.

Diam. 10·5, alt. 7 mill.

Pegu.

N. Haroldi, Godwin-Austen. Pl. 24, fig. 10.

Imperforate, pale umber-brown, with ten spiral thread-like white ribs above, and distant concentric ribs on the base; whorls 7. Diam. 3·3, alt. 2·7 mill.

Andaman Is.

N. gromatica, Godwin-Austen. Pl. 25, figs. 11, 12.

Scarcely perforate, pale ochraceous umber-brown, whorls 7, the last sharply keeled, base flattened, sculptured above with 10 distant spiral thread-like ribs, and four approximate ones near the suture. Diam. 3·4, alt. 2·7 mill.

Munipur Hills.

A variety (fig. 12) differs only in the spiral ribs being 12 to 14 in number.

N. Phulongensis, Godwin-Austen. Pl. 25, fig. 13.

Scarcely perforate, pale sienna-brown, with 6 or 7 spiral ribs above, and five close concentric ribs on the base; whorls $5\frac{1}{2}$, suture well impressed. Diam. 2·5, alt. axis, 2·3 mill.

North Cachar Hills.

N. liricincta, Stoliczka. Pl. 25, fig. 14.

Narrowly umbilicated, thin, with four spiral ribs of which the median ones are stronger, and three or four thin subperipheral